

# Lake of the Woods – 2004 Report

## Total Phosphorus and Secchi Data

Lake Partner Program volunteers collected water samples and water clarity observations at 57 locations throughout Lake of the Woods in 2004. Information was also collected at 66 other locations in the Lake of the Woods area including many locations in Rainy Lake and along the Rainy River. For the third consecutive year, the Lake Partner samples were analysed at the Ontario Ministry of the Environment, Dorset Environmental Science Centre laboratory. Total phosphorus (TP) data collected from 2002 to 2004 is shown in the **Lake of the Woods 2004 Total Phosphorus Data** table. TP data collected prior to 2002 are shown in the **Pre-2002 Total Phosphorus Annual Means** table. Annual water clarity observations (Secchi depths) are shown for all years in the **Lake of the Woods 2004 Secchi Data** table. For help with the interpretation of these results please refer to the **Interpretation of TP and Secchi Results** report.

### Monthly Sample Collection in Lake of the Woods

In 2004, 12 locations were sampled monthly in Lake of the Woods. We now have three years of data for many of these sites. It is interesting to note that there are very few locations in Ontario where monthly observations have been made using precise, low-level TP analysis. These types of data are especially scarce in nutrient enriched systems. From these data we can see that there are differences in the seasonal patterns in different areas of the lake. Some areas show similar spring and fall values with lower summer concentrations while other areas show a consistent increase towards the fall. These monthly data are extremely valuable and will add support to other limnological investigations that are being conducted on Lake of the Woods.

One of the main observations that we can make about these data is that the concentrations change dramatically over the ice-free period at almost every location in the lake. This challenges our traditional approach to describing the nutrient status of a lake. Usually we would observe a spring turnover or ice-free, mean concentration and base our evaluation of the lakes' trophic status on this single number. If the concentration was less than 10 µg/L we would call the lake oligotrophic, between 10 µg/L and 20 µg/L would be mesotrophic and greater than 20 µg/L would be eutrophic. However, many of the stations in Lake of the Woods span all three trophic levels in a single season which makes it difficult to generalize about the nutrient conditions in the lake. These observations will require us to adopt a novel approach to describing total phosphorus in a way that will reflect the impact that the varying concentrations are having on the algal communities. These findings

underline the importance of monthly sample collection in the lake and may require us to expand the number of locations where monthly sampling occurs.

*The Rainy River* is an important source of water and phosphorus to Lake of the Woods. Consequently monthly sample locations were established in 2003 for Rainy Lake and along the Rainy River. These data will help to assess the role of the Rainy River in the TP budget of Lake of the Woods.

### **Summary**

The Lake Partner Program volunteers should be commended for collecting a valuable set of high-quality, data. These data would be impossible to collect without the assistance of volunteers. It is clear that the results will be useful to the on-going limnological projects in Lake of the Woods. Furthermore, it would also be impossible to contact and organize volunteers in the Lake of the Woods area without the support and direction of the Lake of the Woods District Property Owners Association.



